LONG RANGE FACILITIES PLANNING

EXECUTIVE SUMMARY

NATIONAL STEEL AND SHIPBUILDING COMPANY
A MORRISON-KNUDSEN COMPANY

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NATIONAL SHIPBUILDI .NG RESEARCH PROGRAM

SP-1 FACILITI ES PANEL PROJECT

LONG RANGE FACILITIES PLANNING

EXECUTIVE SUMMARY

NATIONAL STEEL AND SHIPBUILDING COMPANY
IN COOPERATION WITH THE
DEPARTMENT OF TRANSPORTATION
MARITIME ADMINISTRATION

APRIL, 1982

LONG RANGE FACILITIES PLAN

TABLE OF CONTENTS

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Executive Summary

Analyses of NASSCO'S growth over the past 20 years has shown, with some ups and downs, a real growth pattern in the order of five percent a year. The data projections suggest that a similar growth may continue. At the present time, however, there is an industry-wide downturn in new ship construction activities that affects NASSCO and will probably last until 1984.

On the technological front NASSCO recognizes the need to modernize, up-grade and improve its facilities, so that it will become more competitive in the maritime industry for new construction and repair work. Improved manufacturing techniques not only improve NASSCO'S position in the marketplace, but will also enhance NASSCO'S ability to react quickly in a time of national emergency.

The company has recognized that if it is to be the leading shipyard on the west coast it must, over the next few years, take the following steps in order to achieve that goal:

1. Achieve complete flexibility in its ability to construct new vessels up to 200,000 deadweight tons, ranging from 100% commercial to 100% Navy construction.
2. To become a major factor in the ship repair business on the west coast; again from all commercial to all Navy work in virtually all sizes ranging from tuna boats to the largest vessels the yard can accommodate.
3. Establish a business plan to pursue non-maritime work in the event of a downturn in new ship construction and repair work. The objective is to maintain a well-trained, stable labor force that will be available to react to future maritime needs.
4. Maintain a high degree of craftsmanship and flexibility so as to be able to act and react quickly to meet the country's needs in times of national emergency.

To achieve an optimum facilities configuration to meet the needs of the business, NASSCO'S Facilities and Industrial

Engineering Department, with the assistance of Richard Muther and Associates, Incorporated, developed a long range facilities master plan covering all essential' operations. Many alternatives were studied and evaluated in depth; the analysis indicated that if NASSCO ever expected to surpass its output of the last several years, current facilities would have to be technologically upgraded.

Due to the tremendous amount of data generated, and the number of reports presented to management on facilities planning, it is not practical nor economical to include them all in this report. Only those documents which are pertinent and useful in demonstrating that the contract has been fulfilled will be included. The contents of this report have been divided into five volumes: Plan Guide Lines, Long Range Capabilities, Industrial Survey, IHI Survey, and Exhibits.

I. Plan Guide Lines

This volume covers five major topics - Mission Statement and Objectives, Yard History, Long Range Facility Planning History, Planning Assumptions and New Construction Capacity Study.

The Mission Statement defines the objectives of the Long Range Plan. It defines how the facilities will eventually evolve to meet the requirements of NASSCO'S business plan. The most important aspect of the facility plan is to provide a shipyard that is very flexible so that it can accommodate to the cyclical nature of the shipbuilding business.

The Yard History gives a brief overview of how the business evolved since it was established in 1905 as the California Iron Works. The company, since its inception, has had a variety of products including garden tractors, fabricated steel structures, winches, wood and steel tuna clippers, barges, shrimp trawlers, speedboats, iron castings, galleys and kitchen equipment. NASSCO'S present product line includes a variety of naval and commercial vessels such as non-combatant support ships and tankers up to 200,000 dead weight tons.

NASSCO'S Long Range Plan History started with an introduction to long range facility planning in January of 1978 at Norfolk,

Virginia at a Society of Naval Architects and Marine Engineers (SNAME) SP-1 Panel Meeting. The Maritime Administration had Richard Muther (an authority on long range facility planning) address a group of shipbuilders and explained the concepts and benefits of long range facility planning. This report represents the progress NASSCO has made since 1978 in facilities planning.

The Planning Assumptions address those items which have an effect on facility requirements. These items will become a very important factor when planning facilities for specific business requirements. Such items addressed are product, growth patterns, construction techniques, etc.

The New Construction Capacity Study considers the current yard capacity and alternatives for increasing that capacity. It addresses new construction capabilities and limitations. The study also focuses on those facilities that would have a major effect on increasing yard throughput. The analysis is summarized into capacity projections for three new construction scenarios - 100 percent commercial, 100 percent Navy and a 50/50 mix of commercial and Navy ships.

II. Long Range Capabilities

This volume is the core of NASSCO'S Long Range Facility Plan. The alternatives for expanding capacity provide several choices for developing an optimum plan for facility utilization. The six alternatives shown provide varying degrees of increasing capacity through expansion. These alternatives will only be used if the business is in a growth mode. At the present time the industry is not in a growth mode and these alternatives have been set aside until the business is in an upward cycle again and additional capacity is required.

The backup data covers all aspects of the business back to 1968. The information has been plotted to establish trends for the last 12 years. This trend information was then used to develop ratios for projecting future requirements out to the year 2005. The base and derived data includes such items as

tonnage, ship mix, employment, production areas (both blue-sky and shop) , berthing, support services, acreage, etc.

III . Industrial Survey

This volume contains the Domestic Shipyard Survey which was conducted in May of 1980 and included 11 U. S. shipyards. The data on each of the yards was compiled into a technology comparison matrix to help NASSCO establish its strengths and weaknesses when compared with other U. S. yards. The matrix chart is backed up with a detailed report of each yard visited.

Iv. IHI Survey

This volume was the result of the Ishikawajima-Hari.ma Heavy Industries Co. (IHI) survey of NASSCO and has been documented in a five volume report covering Accuracy Control, Palletization and Shipbuilding Procedures.

Volume I. Accuracy Control of Hull Construction

This report is the result of a survey on NASSCO'S accuracy control system. The study was designed to reveal problems that cause interruptions in the hull construction process. It highlighted problems in each shop such as erection, assembly, sub-assembly, production control, mold loft and engineering. IHI recommended that NASSCO could improve the accuracy control function by establishing quality control standards, establishment of heat shrinkage allowances and the establishment of standards for production practices.

Volume II. Accuracy Control of Hull Construction Addendum

This document was the result of a second survey to clarify the findings of the initial. survey which resulted in recommendations to help aid in the implementation of the IHI Accuracy Control System.

Volume III. Palletization

This report describes the concepts of palletization and how it can be utilized at NASSCO.

Volume IV. Palletization Addendum

This addendum supplements Volume 111 with additional information on palletization and addresses how it can be implemented at NASSCO.

Volume V. A Survey Report on Shipbuilding Procedures at NASSCO

The survey for improvements focused on the resources used in the shipbuilding business. These resources included layout, facilities, engineering, computer systems, and production methods.

IV. Exhibits

The fifth and final volume of this report demonstrates the activities generated through the long range planning efforts. Two reports are included showing the finalization for a second shipyard to enhance NASSCO'S repair capabilities. This attempt to establish a larger position in repair and overhaul was shelved. A number of factors contributed to the demise of the plan for a second ,yard - the major contributors *were* high interest rates, the general state of the economy, and an expected decline in potential Navy contracts.

With the high cost of capital investment, frequent changes in product mix, and restrictions imposed upon shipbuilders by regulatory agencies (waterfront permits) , a sound long range plan for shipbuilding facilities is critical. With an established long range plan capital expenditures will be applied in the appropriate functional area. Without a facilities plan there is a tendency to spend capital for short-term goals without considering the long-range implications.

This report completes NASSCO'S contractual requirement with the Maritime Administration for developing a long range facility plan. This does not signal the end of long range planning at NASSCO. It has been recognized that in order to have an effective plan, it must evolve through a series of intermediate stages which meet the needs of the company. The foundation has been set and the plan will be continually improved. It will also be reviewed annually and revised as necessary.